


CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8)			Docket No. APP 1208
Applicant(s): Ricardo V. Martija et al			
Application No. 09/774,976	Filing Date 03/31/01	Examiner LAZARO, David R.	Group Art Unit 2155
Invention: Method and System for Determining Geographical Regions of Hosts in a Network			
<p>I hereby certify that this <u>Declaration under 37 C.F.R. 1.131 (4 pages)</u> <i>(Identify type of correspondence)</i></p> <p>is being facsimile transmitted to the United States Patent and Trademark Office (Fax. No. <u>(703) 872-9306</u>)</p> <p>on <u>April 29, 2005</u> <i>(Date)</i></p> <div style="text-align: right; margin-top: 100px;"> <u>Vivian Austin</u> <i>(Typed or Printed Name of Person Signing Certificate)</i>  <i>(Signature)</i> </div>			
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Appl. No. 09/774,976

Attorney Docket APP 1208 US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
R. V Martija et al
Appl. No. 09/774,976
Filed: January 31, 2001
Title: Method and System for Determining
Geographical Regions of Hosts in a Network
Art Unit: 2155
Examiner: David R. Lazaro

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DECLARATION
37 C.F.R. 1.131

We, Ricardo V. Martija, of South Pasadena in the County of Los Angeles, and State of California, Samaradasa Weerahandi of Millburn, County of Union, and State of New Jersey, and Walter D. Sincoskie of Hampton, County of Hunterdon, and State of New Jersey do hereby declare and state that:

We are the co-inventors of the above identified patent application.

Prior to December 29, 2000, we were employed by Bell Communications Research (Bellcore), now after March 17, 1999 known as Telcordia Technologies, Inc., the assignee of this patent application, at their research facility in Morristown, N.J. At that time we were engaged in the research and development of a system and method for determining the geographical location of a host in a public communications network, such as the Internet. Specifically, prior to December 29, 2000, we conceived and successfully operated a system, known as "netsizer", which system is described in the above identified patent application.

To operate the system successfully it was necessary to collect data for triangulation purposes; we collected data from the University of Washington, the University of Virginia, and Illinois State University. The data we collected included the number of hops and traceroute time for each of these monitoring stations.

Prior to operating the system we sorted the classifiable data, i.e., those whose locations are known, from those that were unclassifiable. We then summarized the results of the classified ones (monitor.data) and computed the covariance matrices (monitor.data.covar). We then computed Mahalanobi's distance for the unclassified ones (unknown.data). The file with the distance computations is unknown.dbg.out, and the final output is in file unknown.out.

The data files were in the following path under Martija's home directory. These data files are currently in Martija's possession and included:

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```
rmartija/netsizer/data/tempdir/median/monitor.data.old  
rmartija/netsizer/data/tempdir/median/monitor.data.covar  
rmartija/netsizer/data/tempdir/median/unknown.data  
rmartija/netsizer/data/tempdir/median/unknown.dbg.data  
rmartija/netsizer/data/tempdir/median/unknown.out
```

Prior to December 2000 Martija wrote the program code for the operation of our system. That program code was set forth in program files in the following path also under Martija's home directory. These program files are also currently in Martija's possession and included:

```
rmartija/netsizer/scripts/getCovar.pl  
rmartija/netsizer/scripts/getHostLoc.pl  
rmartija/netsizer/scripts/getHostDistByLoc.pl  
rmartija/netsizer/scripts/getLocalHits.pl  
rmartija/netsizer/scripts/getHitsByState.pl  
rmartija/netsizer/scripts/joinData.pl  
rmartija/netsizer/scripts/run.classify  
rmartija/netsizer/scripts/classify.pl
```

Attached hereto are printouts of program file "getCovar", Exhibit I, "getHostLoc", Exhibit II, and "classify", Exhibit III, showing the dates of May 25, 1999, May 20, 1999, and May 5, 1999, respectively, the dates when these specific program files were last modified.

These files and programs were employed by us at Telcordia during numerous successful operations of our invention at the Morristown, N.J. facilities of my employer prior to December 2000. We operated our system to determine a geographical region of a host in a network using the triangulation data collected to define the selected other hosts in the network at a plurality of geographical regions by determining, at a plurality of points in the network, first sets of information associated with the selected other hosts and second sets of information associated with the host whose geographical region in the network is to be determined, and then determining that geographical region based on the geographical region of one or more of the selected other hosts whose respective means of first sets of information has a shortest weighted vector distance from the second sets of information.

More specifically, we used the traceroute program to collect time delay and number of hops information from each of the monitoring stations (UW, UVa, and IllState) to each of the IP addresses on our list. For some of these addresses we knew the geographical location while for the others we did not. For those IP addresses whose geographic location we knew, we determined their characteristics by computing their covariance matrices and Mahalanobi's distances based on the time delay and hops information collected. We also computed the covariance matrices and Mahalanobi's distances for those IP addresses whose geographical locations were unknown. We calculated the Mahalanobi's distance (which is a function of all distance related measures and their covariances) between a location-unknown host from location-known hosts and

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assigned it to the locality of the location-known host having the minimum distance. "Triangulation" was used to determine where these unknown IP addresses would be most likely located.

We used the program `rmartija/netsizer/scripts/run.classify` to invoke the program `rmartija/netsizer/scripts/classify.pl`. These two programs are used in the initial step of our method to select the other hosts in the network such that the selected other hosts are located in a plurality of geographical regions that are determinable.

Specifically, in successfully operating our method and system, the processes we used in determining the geographic location of hosts in a network included initially creating three `rmartija/netsizer/data/tempdir/median` files named `illinois`, `virginia`, and `washington`, respectively, and which contained the hosts whose locations (at the state level) we knew. Each of these files had four columns, as follows:

- Column 1: IP address of the host whose location we knew
- Column 2: State address where this IP address is located
- Column 3: Traceroute hops metric from a given monitoring station
- Column 4: Delay metric from a given monitoring station

For columns 3 and 4, the file names identify the monitoring station. For example, the following entry in the file named "virginia"

```
130.132.153.175 CT 13 38
```

told us that host 130.132.153.175 is in Connecticut and that its hop and delay metrics as measured from our monitoring station in Virginia are 13 and 38, respectively. The program `rmartija/netsizer/scripts/joinData.pl` joined the information from these three files and produced an output file similar to `rmartija/netsizer/tempdir/median/monitor.data.old`. This output file had seven columns, as follows:

- Col 1: location (state)
- Col 2: hop metric from Illinois monitoring station
- Col 3: delay metric from Illinois monitoring station
- Col 4: hop metric from Virginia monitoring station
- Col 5: delay metric from Virginia monitoring station
- Col 6: hop metric from Washington monitoring station
- Col 7: delay metric from Washington monitoring station

The file `monitor.data.old` was used as the input to the program `getCovar.pl` to compute the covariance matrix. The output of `getCovar.pl` is the covariance matrix file named `rmartija/netsizer/data/tempdir/median/data.covar`.

For the hosts whose locations had yet to be determined, the raw data files were placed in the following files:

```
rmartija/netsizer/data/netsizerStats.global.ilstu  
rmartija/netsizer/data/netsizerStats.global.virginia
```

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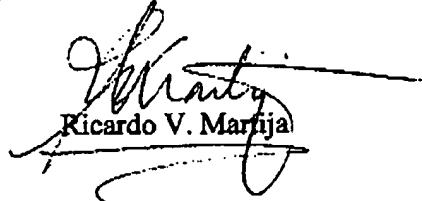
rmartija/netsizer/data/netsizerStats.global.washington

These three files were then joined to produce the file
rmartija/netsizer/data/tempdir/median/unknown.data. This output file had seven columns,
as follows:

Col 1: IP address (i.e. host) whose location needs to be identified
Col 2: hop metric from Illinois monitoring station
Col 3: delay metric from Illinois monitoring station
Col 4: hop metric from Virginia monitoring station
Col 5: delay metric from Virginia monitoring station
Col 6: hop metric from Washington monitoring station
Col 7: delay metric from Washington monitoring station

Using the program rmartija/netsizer/scripts/getHostLoc.pl, we then determined the geographic location of the hosts in the file "unknown.data". The program getHostLoc.pl script took as input the "covar" and "unknown" data files and produced the output file rmartija/netsizer/data/tempdir/median/unknown.out. Thereby we successfully operated our method to determine the geographic location of hosts in a network.

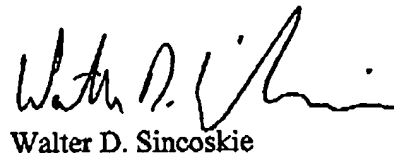
We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States code, and that such willful statements may jeopardize the validity of the application or any patent issued thereon.


Ricardo V. Martija

Date 04/14/2005


Samaradasa Weerahandi

Date 4/25/05


Walter D. Sincoskie

Date 4/29/05